ABSTRACT

Title of Thesis:	EFFECTS OF MEDICAID STATE PLAN DENTAL BENEFITS ON DENTAL VISITS AMONG NON-ELDERLY ADULTS
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Using the Behavioral Risk Factor Surveillance Survey and optional Health Care Access module, I analyzed dental visits between insurance types and between three levels of Medicaid dental coverage for non-elderly adults in each state defined as no benefits or emergency-only, offering 1-4 services and offering 5 or more service types. I find Medicaid adults are less likely to experience a dental visit compared with adults covered by private insurance. I also find a statistically significant relationship between the level of benefits offered to beneficiaries and the odds of experiencing a dental visit in the previous year. Understanding factors associated with the use of dental services is necessary to adequately address health needs of the Medicaid population and unnecessary emergency room use for non-emergency dental services.

EFFECTS OF MEDICAID STATE PLAN DENTAL BENEFITS ON DENTAL VISITS AMONG NON-ELDERLY ADULTS

by

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Chapter 1: Background

Overall, roughly 90% of US adults have experienced a cavity and more than 25% have untreated cavities (CDC, 2016). Adults with income below 100% federal poverty level face more than twice the rate of untreated cavities compared with those at or above 200% federal poverty level. Further, compared with Whites, people of color have much higher rates of untreated cavities (Hinton & Paradise, 2016).

The American Dental Association (ADA) recommends regular dental visits to maintain oral health and prevent oral disease (ADA, 2013). The National Center for Health Statistics reports that in 2015, 64% of US adults aged 18-64 years had a dental visit. Compared with Whites who were more likely to see the dentist (64.6%), African Americans (59.4%) and Hispanics or Latinos (53.2%) were much less likely to have had a dental visit in the previous year. Further, there are large disparities in having a dental visit by income. Those who fall below 100 percent federal poverty level are much less likely to have experienced a dental visit (45%) compared with those who make above 400 percent federal poverty level (79.2%). Finally, among those who fall below 100 percent federal poverty level, Whites are still more likely to have seen a dentist (46.9%) compared with African Americans (44.8%) and Hispanics or Latinos (40.8%) (National Center for Health Statistics, 2017).

Access to oral health services is critical because oral health is often a barometer for other measures of physical, mental, and social well-being. Poor oral health may result in bad breath, swelling, pain, infection, and tooth loss. Risk factors for oral disease, in addition to socioeconomic factors, include tobacco use, medications,

genetics, hormonal changes in females, and other illnesses (National Institute of Dental and Craniofacial Research, 2013). Poor oral health may also contribute to significant loss of income due to work loss (Reisine, 1984). Oral health outcomes are associated with chronic diseases and may further complicate control and treatment of those diseases (Griffin, Barker, Griffin, Cleveland, & Kohn, 2009). In addition, presence of oral disease is known to be associated with coronary heart disease (Zanella et al., 2016), diabetes (Preshaw et al., 2012), and may impact pregnancy outcomes (American Dental Association, 2011).

Adequate access to dental services is essential to achieve positive oral health outcomes and mitigate and prevent oral disease. Insurance coverage for dental services is positively associated with access, use of dental services, and dental expenditures (Manski, Macek, & Moeller, 2002). The Affordable Care Act elevated pediatric dental services as one of the ten essential health benefits offered through qualified health plans in the marketplaces, however adult dental is not included in the mandate (Patient Protection and Affordable Care Act, 2010). In marketplace plans, adult dental benefits are offered as embedded within a health plan or more often, as stand-alone plans offered as family coverage. While some states offer dental plans directly in the marketplaces others point consumers to purchase directly from insurance carriers (Cousart, Snyder, & Mention, 2015).

By 2014, 58.1% of adults 19-64 had private dental coverage and 6.7% had public coverage with dental benefits (Nasseh & Vujicic, 2016). Among adults with health coverage in the marketplaces, 21.2% of adults also acquired dental benefits, 26.7% among adults 26-34 years (Vujicic & Yarbrough, 2014). Although the Affordable Care

Act did not include adult dental benefits in the "ten essential health benefits" package, there is evidence that the dependent coverage mandate has had a positive impact on private coverage among young adults. One analysis found the rate of young adults with private dental benefits increased by 6.7% due to this provision (Shane & Ayyagari, 2015).

In the Medicaid program, adult dental services are an optional state benefit for traditional and expansion populations (Hinton & Paradise, 2016). In 2015, 18 states provide emergency only or no dental services, 17 states offered a limited set of services, and 15 states offered extensive dental services with state limits on dollars spent and services provided (Snyder & Kanchinadam, 2015), (MACPAC, 2015a). Further, services for specific populations differ based on the state's decision to expand the Medicaid program under the Affordable Care Act, whether the state chooses to expand services to a specific population under a Section 1115 demonstration waiver, and whether the state is offering dental services at the same level in fee-for-service and managed care Medicaid programs (Snyder & Kanchinadam, 2015), (MACPAC, 2015a). State's also have the ability to provide a more robust set of dental services to pregnant women, to the extent that they impact pregnancy outcomes, under guidelines for the treatment of the categorically needy (42 CFR 440.210, 1995), (Silverman, 2012).

There is significant evidence that inadequate Medicaid coverage and payment for adult dental services has an impact on use of dental services within hospital emergency rooms and other providers (California HealthCare Foundation, 2011), (Cohen, Manski, Magder, & Mullins, 2002), (Singhal et al., 2015). One study also

found that Medicaid expansion reduced hospital visits for dental services at the state-level (Laniado, Badner, & Silver, 2017). The ADA notes that hospital emergency department visits for dental services grew steadily from 2000 to 2010 and cost the health care system as much as $2 billion dollars in 2010 (Wall & Nasseh, 2013). Although there is strong evidence that Medicaid benefits are critical to adequate access to dental services among the adult population, authors concede that the number of available dentists is also a critical factor to consider (Fingar et al., 2015), (Okunseri, Szabo, Garcia, Jackson, & Pajewski, 2010).

An analysis of the impact of Medicaid coverage on dental service use found that any Medicaid coverage of low-income adults is associated with increased likelihood of a dental visit between 16.4% to 22% (Choi, 2011). This analysis compared states who offered any Medicaid benefits and those that did not. In addition, an early analysis of the Affordable Care Act's impact on dental care use among low-income adults found that Medicaid expansion had little effect on the use of dental services among this population (Nasseh & Vujicic, 2017). However, these studies do not take into account the variation in scope of services between states that offer adult dental coverage. Further, their methods do not account for associated cost-sharing and service limits in each state.

This work fills a gap in the understanding of the extent to which the scope of dental benefits in Medicaid is associated with changes in access to dental services among the non-elderly adult population. First, by comparing the rates of dental visits among non-elderly adults by plan type I outline the performance of each plan type on a measure of dental access. In this analysis I include adults insured by employer-sponsored insurance

(plans acquired through a workplace), directly purchased insurance (plans consumers purchased directly from a carrier or marketplace), Medicaid, and the uninsured.

Next, I analyze dental visits among nonelderly adults on Medicaid compared with three levels of adult Medicaid dental benefits offered by the state plan. Understanding the relationship between scope of services and dental service use is necessary to achieve the goals of the Medicaid program in addressing the health needs of beneficiaries. Further, better understanding this relationship may assist state policy-makers who are faced with increased ED use for dental services.

Chapter 2: Research Questions/Specific Aims

The objectives of this manuscript are to;

i. Identify the relationship between insurance type and access to dental services among non-elderly adults by comparing the performance of Medicaid coverage with ESI, self-purchased, and the uninsured against the odds of having a dental visit in the previous 12 months;
ii. Identify the relationship between the scope of Medicaid coverage of dental services and access to dental services among Medicaid covered non-elderly adults

Chapter 3: Methods

Overview

This study uses 2014-2016 samples of the Behavioral Risk Factor Surveillance System (BRFSS) and the optional Health Care Access (HCA) module to estimate the odds of having a general dental visit between payers and between state Medicaid dental coverage levels among non-elderly, non-institutionalized US adults aged 18 to 64 years. Adults aged 65 and older are excluded (despite dental coverage in Medicaid) to reflect the age categories of the policies being addressed and to avoid miscalculation of those who may acquire dental benefits through Medicare Advantage plans.

The BRFSS is a cross-sectional telephone survey conducted by state health departments with support from the Centers for Disease Control and Prevention (CDC) to collect behavioral health information used to inform local/state/federal health-related policymaking. The survey is comprised of a standard questionnaire, a rotating core, optional modules, and state-added questions. Landline telephone numbers are sampled based on household and cellular lines are sampled as single adult households. Both samples are based on the geographic within-state region. The landline sample uses a disproportionate stratified sampling design based on high-density and medium-density strata at a ratio of 1:1.5 high to low. Respondents from the cellular phone sample have an equal probability of being selected. The sample design is weighted and raked based on telephone ownership, education level, marital status, home ownership, age, sex, race, ethnicity, and region (CDC, 2013).

The Health Care Access (HCA) module contains nine questions collecting information on health insurance coverage, access to health services, and affordability of services (CDC, 2015). In 2014 this module was used by the following states:

- Alabama, Alaska, Arizona, Connecticut, Delaware, District of Columbia, Georgia, Idaho, Illinois, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin.

In 2016 this module was used by the following states:

- Delaware, District of Columbia, Georgia, Kentucky, Louisiana, Minnesota, New Mexico, Pennsylvania

In addition to the publicly available BRFSS files additional state-level characteristics were merged by state/year including the level of dental coverage offered in Medicaid identified by MACPAC, number of dental health professional shortage areas pulled from HRSA state profiles, median income estimates by the US Census Bureau, and the state Medicaid expansion status as reported by CMS and MACPAC. Identified by the literature, these additional variables are necessary to accurately measure the relationship between coverage and access of dental services.

Analysis

In this manuscript I estimate four separate models within two distinct analysis groups. Each individual model uses logistic regression to estimate the odds of having a dental visit in the previous year among non-elderly adults. The sample populations change based on the aims being addressed in each group of analyses. The first population sample consists of nonelderly adults with either employer-sponsored or directly purchased private insurance, Medicaid, and the uninsured. The second population sample consists of those who have Medicaid only. The first group analysis is focused on the performance of the dental outcome between nonelderly adults on Medicaid compared with adults with employer-sponsored insurance (ESI), insurance purchased directly from a carrier, and the uninsured. This model is adjusted to reflect the disproportionate stratified sampling design of the BRFSS weighting at the person-level, primary sampling unit, and strata. The second group analysis is focused only on the Medicaid population. For these two analyses, standard error calculations are clustered at the state level by applying the primary sampling unit set to the state fips code. I also adjust for the final person-weight. Stata 15 was used to carry out this analysis.

Aim 1: Identify the relationship between insurance type and access to dental services among non-elderly adults

Model 1: I compare the performance of Medicaid coverage with ESI, self-purchased, and the uninsured against the odds of having a dental visit in the previous 12 months where:

Dental Visit in the Previous Year =α+β1(insurance type) + β2(income)+ β3(age)+ β4(sex) β5(race)+ β6(marital status) + β7(education)+β8(health status) + β9(#days mental health not good) + β10(year)+e

Aim 2: Identify the relationship between the scope of Medicaid coverage of dental services and access to dental services among Medicaid covered non-elderly adults

Model 1: I compare the odds of having a dental visit, among non-elderly adults (18-64) who are covered by Medicaid-only, with the level of dental benefits offered by the state Medicaid program as defined by MACPAC's June 2015 Report to Congress on Medicaid and CHIP:

- None or Emergency-Only
- 1-4 dental services
- 5 or more dental services

This base model does not control for other state-level covariates.

Dental Visit in the Previous Year =α+β1(level of Medicaid benefits) + β2(income)+ β3(age)+ β4(sex) β5(race)+ β6(marital status) + β7(education)+β8(health status) + β9(year) + e

Aim 2.
Model 2: Next, I saturate the base model by adding state-level covariates (Medicaid expansion status and state-median income). Graphic displays of these state characteristics can be found in the appendix for further reference.

Dental Visit in the Previous Year =α+β1(level of Medicaid benefits) + β2(income)+ β3(age)+ β4(sex) β5(race)+ β6(marital status) + β7(education)+β8(health status) + β9(year) + β9 (Medicaid expansion) + β10(state median income) + e

Aim 2
Model 3: Finally, I control for the number of HRSA designated dental health professional shortage areas in the state in addition to other state-level covariates

Dental Visit in the Previous Year =α+β1(level of Medicaid benefits) + β2(income)+ β3(age)+ β4(sex) β5(race)+ β6(marital status) + β7(education)+β8(health status) +

β9(year) + β9 (Medicaid expansion) + β10(state median income) + β11 (#HPSAS) + e

Conceptual Framework

I use the Andersen Health Behavior Model as a conceptual framework to categorize covariates in all analyses as predisposing, enabling, or need-based factors (Andersen, 1995). This framework is frequently used to explain health services utilization, taking into account socio-economics and health behaviors (Chen, Vargas-Bustamante, Mortensen, & Ortega, 2016), (Jahangir, Irazola, & Rubinstein, 2012). Further, this model has been previously used to evaluate dental coverage and utilization of dental services (Kuthy, Odom, Salsberry, Nickel, & Polivka, 1998).

Independent variables through the Andersen framework:

- Predisposing variables: (age, sex, race, marital status)
- Enabling variables: (income, education, insurance type, dental coverage, state level of Medicaid benefits, #HPSA, state-median income, Medicaid expansion status)
- Need variables: (perceived health status)

Chapter 4: Results

Key Findings

Aim 1: Identify the relationship between insurance type and access to dental services among non-elderly adults

In table 1 (available in the appendices) I outline characteristics of the Aim 1 sample by type of health insurance reported in the optional HCA module. Respondents from the 2017 interview year were excluded to increase accuracy of the estimates due to unavailability of state-level data for 2017. The final sample consists of 161,573 individual observations from the states who used this module (outlined in methods overview section). Due to the optional status of this module these estimates are not proportionate to the US population and this should be considered while consuming these estimates. After applying the survey weights the sample is estimated to be 86,990,884 individual observations with health insurance that is either employer-sponsored, directly purchased, Medicaid, or uninsured respondents. Rates within table 1 are weighted to reflect the sample design of the BRFSS.

Overall, roughly 73% of individuals in the sample population had a dental visit in the previous year. I estimate roughly 20% higher rates of dental visits among those insured by private insurance types (ESI, self-buy) compared with Medicaid and the uninsured who fall just over 50%. Individuals covered by private insurance types have disproportionately higher incomes compared with those on Medicaid and the uninsured, as expected. Overall, 60% of the sample population earn a household income above $50,000. Age and sex are relatively evenly split within insurance types and in the overall sample population. Within both private insurance types non-Hispanic

whites make up roughly 75% of the population while the Medicaid and uninsured populations have more diversity by race/ethnicity. Overall, the sample leans disproportionately white compared with the national population. Further, more than 80% of the total sample falls within the 2014 survey calendar. This, again, is due to the optional status of this module and state budgeting decisions to conduct the BRFSS modules.

Table 2. Logistic regression of dental visit in past 12 months among non-elderly adults by insurance type, 2014&2016 BRFSS

Dental Visit	Odds Ratio	Std. Err.	t	P>|t|
Insurance Type				
Medicaid	Ref.			
esi	1.394845	.0585151	7.93	0.000
self-buy	1.157854	.0552192	3.07	0.002
uninsured	.9256757	.166181	-0.43	0.667
Income				
<$10,000	Ref.			
$10,000-$19,999	1.003479	.0640837	0.05	0.957
$20,000-$34,999	1.093691	.0672948	1.46	0.146
$35,000-$49,999	1.312971	.0850996	4.20	0.000
$50,000-$74,999	1.668835	.108675	7.86	0.000
$75,000+	2.565606	.1679146	14.40	0.000
Age (years)				
18-24	Ref.			
25-34	.5634944	.026461	-12.21	0.000
35-44	.6085782	.0288166	-10.49	0.000
45-54	.7042323	.0320936	-7.69	0.000
55-64	.8140722	.0366975	-4.56	0.000
Sex				
Female	1.49686	.0330603	18.26	0.000
Race				
Non-Hisp. White	Ref.			
Non-Hisp. Black	.8809782	.031215	-3.58	0.000
Non-Hisp. Multiple/Other	.7875772	.0387129	-4.86	0.000
Hispanic	1.101783	.050018	2.14	0.033
Marital Status				
Married	1.117518	.0282071	4.40	0.000
Education				
H.S. or Less	Ref.			

Some College	1.183442	.0315113	6.33	0.000
Bachelor's or More	1.598242	.0438182	17.10	0.000
Health Status				
Very Good/Excellent	Ref.			
Good	.7627054	.0185806	-11.12	0.000
Fair/Poor	.6258515	.0231496	-12.67	0.000
Days Mental Health Not Good Past Month				
0	Ref.			
1-10	.9534231	.0246305	-1.85	0.065
11-20	.8792158	.0451338	-2.51	0.012
21-30	.7851098	.036794	-5.16	0.000
Interview Year				
2014	Ref.			
2015	.7298379	.094329	-2.44	0.015
2016	.927596	.0270834	-2.57	0.010
_cons	1.378536	.0930826	4.75	0.000

Race category non-Hisp. Multiple/Other includes Asian, AIAN, Native Hawaiian/Pacific Islander, and other.
Source: BRFSS 2014&2016

In this Aim 1: Model 1 analysis I estimate a logistic regression model comparing the odds of having a dental visit in the previous year between insurance types (Medicaid(ref), ESI, self-purchased, and uninsured). This model is calculated to outline the performance across payers on "visits" as a measure of access to dental care. Compared with Medicaid(ref.) overall, individuals with employer-sponsored insurance are 1.4 times as likely to have had a dental visit in the previous 12 months and those who purchase insurance directly are 1.15 times as likely to experience a dental visit. Both of these findings are statistically significant with p-values below 0.01. Income is a strong predictor of experiencing a dental visit. Both findings for insurance type and income on dental visits is consistent with current literature on dental access (Hinton & Paradise, 2016).

Compared with ages 18-24, older adults are less likely overall to experience a dental visit. With these data I was unable to exclude individuals up to age 21 who may have EPSDT coverage through Medicaid and expansion CHIP programs and this may explain that effect on age. Compared with non-Hispanic whites, adults of Hispanic ethnicity are 1.1 times as likely to experience a dental visit (p=0.03) while non-Hispanic blacks and non-Hispanic individuals who fall into the multiple race category are less likely to have experienced a visit (p=0.00). Mental health status also plays a role in receiving a dental visit. I estimate that compared with those who experience no poor mental health days in the previous month, adults who experienced 11-20 poor mental health days were .89 times as likely to experience a dental visit in the previous year (p=0.02) and those who experienced 21-30 poor mental health days were .80 times as likely to experience a dental visit in the previous year (p=0.00). Overall, this model tells us that income and insurance type are important drivers of experiencing a dental visit. Although these findings are well known to the dental care literature I establish the relationship to better outline the underperformance of Medicaid in the dental sector. To better explain use of dental services within the Medicaid population I move to the second Aim which seeks to identify the relationship between the scope of Medicaid coverage of dental services and access to dental services among Medicaid covered non-elderly adults (18-64 years).

In the Aim 2 models respondents from the 2017 interview year were excluded to increase accuracy of the estimates due to unavailability of Medicaid coverage data for 2017. The final sample consists of 15,042 Medicaid-covered individuals within the states who used this module (outlined in methods overview section). Due to the

optional status of this module these estimates are not proportionate to the US Medicaid population and this should be considered while consuming these estimates. However, this sample is proportionate to the Medicaid population among all participating states. Weighted, the Medicaid sample is estimated to be 9,420,902 individuals.

Table 3 presents characteristics of the Medicaid cohort by the level of Medicaid benefits offered in their state. The rates presented in this table are weighted to reflect the final person-weight within each state. Overall, I find 52% of the sample experienced a dental visit in the previous year. Across levels of coverage I see rates increase as the level of coverage increases with 57% of adults in the "5 or more" column having experienced a dental visit in the previous year. Proportions of income within coverage levels are consistent with the majority of observations falling below $35,000 household earnings. Age is also evenly distributed within and between coverage levels. The overall sample is disproportionately female, comprising 67% of the total sample population. Compared with the previous sample of all payer types, this Medicaid cohort is more racially proportional to the US population with whites holding 55% of the sample population followed by blacks at 24%. I estimate that 73% of the sample are not currently married and 61% have a high school diploma or less. Compared with the all payer sample, this Medicaid cohort reports worse health status with 33% of the sample population reporting "fair" or "poor" health status.

Among state-characteristics 75% of the sample reside in a state that has expanded Medicaid. 38% of the sample population reside in a state with a median income that falls within the first quartile of the sample. Further, 66% of adults in this sample reside in a state that falls within the 3rd and 4th quartiles for number of dental

health professional shortage areas. Again, due to the optional nature of the Health Care Access module, 82% of the total sample fall within the 2014 interview year.

Table 4. Logistic Regression of Dental Visits among Medicaid (only) Non-Elderly Adults by Medicaid Dental Benefits. Base Model, clustered on state-level, 2014&2016 BRFSS:

Dental Visit	Odds Ratio	Std. Err.	t	P>|t|
Dental Benefits				
None or Emergency-Only	Ref.			
1-4 Services	1.630094	.2252675	3.54	0.001
5+ Services	2.081939	.2514833	6.07	0.000
Income				
<$10,000	Ref.			
$10,000-$19,999	1.165958	.0679316	2.64	0.011
$20,000-$34,999	1.401658	.1020654	4.64	0.000
$35,000-$49,999	1.159689	.1716552	1.00	0.322
$50,000-$74,999	2.254928	.3987537	4.60	0.000
$75,000+	2.85265	.5203376	5.75	0.000
Age (years)				
18-24	Ref.			
25-34	.6787809	.0607467	-4.33	0.000
35-44	.5948479	.0529322	-5.84	0.000
45-54	.6215402	.0695445	-4.25	0.000
55-64	.6552471	.070879	-3.91	0.000
Sex				
Female	1.279758	.086175	3.66	0.001
Race				
Non-Hisp. White	Ref.			
Non-Hisp. Black	1.265693	.116618	2.56	0.014
Non-Hisp. Multiple/Other	.9465611	.1030249	-0.50	0.616
Hispanic	1.317072	.0954702	3.80	0.000
Marital Status				
Married	.9872225	.0618913	-0.21	0.838
Education				
H.S. or Less	Ref.			
Some College	1.084181	.0783194	1.12	0.269
Bachelor's or More	1.521346	.1137252	5.61	0.000
Health Status				
Very Good/Excellent	Ref.			
Good	.8460373	.0598702	-2.36	0.022
Fair/Poor	.7595414	.0575859	-3.63	0.001
Interview Year				

2014	Ref.			
2015	.4840427	.2488268	-1.41	0.164
2016	.9284691	.0989308	-0.70	0.489
_cons	.6499981	.1031552	-2.71	0.009

In this Aim 2: Model 1 analysis I estimate a logistic regression (clustered at the state-level) model comparing the outcome variable (dental visit in the previous year) with the independent variable (state Medicaid coverage of dental benefits for adults). I use a base model to outline the basic relationship between these variables and the individual-level covariates to explain the state-covariates in the second model of this aim. Individual-level covariates in this model include income, age, sex, race/ethnicity, marital status, education, health status, and interview year. Due to limited data, Medicaid coverage levels are held constant across years at levels reported by the Medicaid and CHIP Payment and Access Commission's (MACPAC) analysis of Medicaid state plans in 2015.

I find a statistically significant relationship between dental visits in the previous year and the level of Medicaid benefits offered by the state of residence among this non-elderly adult Medicaid cohort. Compared with states with no or emergency-only benefits, I find that individuals who reside in states with 1-4 services are 1.63 times as likely to experience a visit (p=0.00). In addition, I find those who fall within states that offer 5 or more services to beneficiaries are 2.1 times as likely to experience a dental visit (p=0.00) compared with none or emergency-only states. These findings are a contribution to current literature which currently lacks evidence of the relationship between the scope of Medicaid benefits and use of dental services.

Consistent with current literature I find income to be a strong predictor of experiencing a dental visit with Medicaid beneficiaries who earn a household income

of $75,000 or more experiencing 2.9 times the odds of having a dental visit in the previous year. Compared with individuals aged 18-24 I estimate that all older age categories experience decreased odds of having a dental visit. This relationship is significant at the 0.00 level for every age category. Again, this effect may be caused by the lack of ability to exclude individuals with EPSDT coverage. Those beneficiaries may be driving up the rate of experiencing a dental visit in this sample because they have comprehensive coverage for dental services with limited to no cost-sharing. Notably, I also estimate that among this Medicaid cohort, blacks (OR=1.27, p=0.01) and Hispanics (OR=1.32, p=0.00) experience increased odds of having a dental visit compared with their white counterparts.

Table 5. Logistic Regression of Dental Visits among Medicaid (only) population with State Characteristics (Median Income, Expansion), clustered on state-level, 2014&2016 BRFSS:

Dental Visit	Odds Ratio	Std. Err.	t	P>|t|
Dental Benefits				
None or Emergency-Only	Ref.			
1-4 Services	1.593848	.2245092	3.31	0.002
5+ Services	1.899467	.2120208	5.75	0.000
Income				
<$10,000	Ref.			
$10,000-$19,999	1.164581	.0688893	2.58	0.013
$20,000-$34,999	1.36827	.0978396	4.38	0.000
$35,000-$49,999	1.126432	.162483	0.83	0.413
$50,000-$74,999	2.181548	.3821826	4.45	0.000
$75,000+	2.765933	.5172562	5.44	0.000
Age (years)				
18-24	Ref.			
25-34	.6679996	.0620711	-4.34	0.000
35-44	.5830975	.0533039	-5.90	0.000
45-54	.6086837	.0704875	-4.29	0.000
55-64	.6427202	.0709553	-4.00	0.000
Sex				
Female	1.295634	.0871465	3.85	0.000
Race				

Non-Hisp. White	Ref.			
Non-Hisp. Black	1.25627	.1062274	2.70	0.009
Non-Hisp. Multiple/Other	.9267627	.1022394	-0.69	0.494
Hispanic	1.272263	.0988222	3.10	0.003
Marital Status				
Married	.9981314	.0632582	-0.03	0.977
Education				
H.S. or Less	Ref.			
Some College	1.083314	.0783294	1.11	0.274
Bachelor's or More	1.500828	.1103266	5.52	0.000
Health Status				
Very Good/Excellent	Ref.			
Good	.850154	.059939	-2.30	0.026
Fair/Poor	.7714981	.0600832	-3.33	0.002
Medicaid Expansion				
Yes	1.006835	.10434	0.07	0.948
State Median Income	1.000014	5.43e-06	2.50	0.016
Interview Year				
2014	Ref.			
2015	.4824292	.2605834	-1.35	0.183
2016	.9458362	.1035339	-0.51	0.613
_cons	.3273854	.1088167	-3.36	0.002

In Aim2: Model 2 I saturate the base model with state-level covariates to control for characteristics within states that might impact the estimates on the relationship between Medicaid coverage and use of dental services among Medicaid covered adults. In this second model I add state Medicaid expansion status and state median-income. Due to limited data, Medicaid coverage levels are held constant across years at levels reported by the Medicaid and CHIP Payment and Access Commission's (MACPAC) analysis of Medicaid state plans in 2015 (MACPAC, 2015b). Expansion status is as reported by MACPAC and CMS for each survey year. State median-income estimates were compiled from US Census Bureau reports for each year (Guzman, 2017; Posey, 2016).

After controlling for state-level covariates, I still find the same effect between Medicaid coverage levels and the use of dental services. I estimate that compared with states who offer no or emergency-only dental benefits to non-elderly adult beneficiaries, individuals who reside in states that offer 1-4 services are 1.6 times as likely to experience a dental visit in the previous year (p=0.00). Further, those who reside in a state that offers 5 or more services are 1.89 times as likely to experience a dental visit compared to individuals who reside in a no benefit or emergency-only state (p=0.00).

With this saturated model I still estimate increased odds of having a dental visit among non-Hispanic black and Hispanic populations compared to non-Hispanic white counterparts. Although the effect for Medicaid expansion is not significant, it seems to have a null effect on the outcome of interest. The same is true for the state median income. This effect may be due to the limited number of states reporting the HCA module and the particular mix of benefit levels offered by those participating states.

Table 6. Logistic Regression of Dental Visits among Medicaid (only) population with State Characteristics (Median Income, Expansion, HPSAs), clustered on state-level, 2014&2016 BRFSS:

Dental Visit	Odds Ratio	Std. Err.	t	P>|t|
Dental Benefits				
None or Emergency-Only	Ref.			
1-4 Services	1.586948	.2023367	3.62	0.001
5+ Services	1.944931	.2078893	6.22	0.000
Income				
<$10,000	Ref.			
$10,000-$19,999	1.162763	.0682694	2.57	0.013
$20,000-$34,999	1.366788	.0976661	4.37	0.000
$35,000-$49,999	1.133213	.1663339	0.85	0.398
$50,000-$74,999	2.176001	.382141	4.43	0.000
$75,000+	2.785273	.5202973	5.48	0.000
Age (years)				

18-24	Ref.			
25-34	.6696144	.0623198	-4.31	0.000
35-44	.5855678	.0534201	-5.87	0.000
45-54	.6107716	.0706862	-4.26	0.000
55-64	.642207	.0718114	-3.96	0.000
Sex				
Female	1.29591	.0870806	3.86	0.000
Race				
Non-Hisp. White	Ref.			
Non-Hisp. Black	1.272082	.1107569	2.76	0.008
Non-Hisp. Multiple/Other	.920303	.0973968	-0.78	0.436
Hispanic	1.253819	.0968767	2.93	0.005
Marital Status				
Married	.9978808	.0635453	-0.03	0.974
Education				
H.S. or Less	Ref.			
Some College	1.08391	.0781701	1.12	0.269
Bachelor's or More	1.498341	.1094841	5.53	0.000
Health Status				
Very Good/Excellent	Ref.			
Good	.8530486	.0604887	-2.24	0.029
Fair/Poor	.7746761	.060449	-3.27	0.002
Medicaid Expansion				
Yes	1.025507	.1095862	0.24	0.815
State Median Income	1.00001	5.48e-06	1.82	0.075
#HPSAS	.9984312	.0008861	-1.77	0.083
Interview Year				
2014	Ref.			
2015	.4923478	.2590272	-1.35	0.184
2016	.9527841	.0947694	-0.49	0.629
_cons	.4662681	.1769413	-2.01	0.050

In the final Aim 2 model I add the number of HRSA designated dental health professional shortage areas to align with current literature that the number of dentists pays a significant role in access to dental services (Fingar et al., 2015), (Okunseri, Szabo, Garcia, Jackson, & Pajewski, 2010). I estimate that compared with states who offer no or emergency-only dental benefits to non-elderly adult beneficiaries,

individuals who reside in states that offer 1-4 services are 1.59 times as likely to experience a dental visit in the previous year (p=0.00). Further, those who reside in a state that offers 5 or more services are 1.94 times as likely to experience a dental visit compared to individuals who reside in a no benefit or emergency-only state (p=0.00). Although I do not find statistically significant results with the dental health professional covariate the odds ratio suggests a negative relationship between additional HPSA designations and dental visits, consistent with current literature.

To test whether the effect between Medicaid coverage levels and dental visits is unique to the Medicaid cohort I estimate a final logistic regression model (table 7). To estimate this model, I hold all variables identical to the previous saturated model, but I run the model on a subpopulation of low-income individuals with private insurance and exclude Medicaid. Compared with individuals who reside in states with no or emergency-only services I found no statistically significant difference in the odds of experiencing a dental visit for those residing in states that offer 1-4 or 5 or more services. This table is included in the appendices for reference and adds to the argument that my findings are a contribution to current literature.

Limitations

The data and methods used in this analysis present several important limitations. First, this study does not control for dental coverage as there is no ability to do so in the BRFSS. I must assume dental coverage at the individual level based on insurance type. However, the estimates for use of dental services are an indication of having dental services. Additionally, not all states report insurance type and those that report the HCA module is not consistent across years. Because the HCA module is

optional many states choose to ask these questions sporadically. The literature finds payment for dental services a significant factor in Medicaid for the number of providers willing to accept Medicaid patients. Payment for dental was collinear with level of benefits and other state-level variables in the Aim 2 models, however I did control for the number of dental health professional shortage area designations. In this analysis there was no way to exclude young adults who receive EPSDT coverage until age 21. Adults 18-20 are eligible for comprehensive dental benefits under Medicaid and CHIP programs (MACPAC, 2015) however age is provided in a categorical variable from the BRFSS removing the ability to exclude these individuals. Further, I categorize states in the Aim 2 analyses by the number of service categories they offer, not based on copays and service limits. These factors may also have a significant impact on whether Medicaid covered adults experience a dental visit. In addition to state copays and service limits I did not account for dental coverage differences between FFS vs Managed Care and states that expand coverage for specific services under Section 1115 waiver authority. Finally, the outcome variable, having any dental visit in the previous 12 months, limits any ability to understand the impact of coverage levels in Medicaid. Although this is the only dental health outcome available in the BRFSS a different dataset measuring expenditures will shed more light on the impact of scope of coverage and performance of Medicaid coverage compared with private insurance types.

Discussion/Conclusions

In Aim 1, I estimated the odds of experiencing a dental visit between payers and the uninsured. Compared with Medicaid, individuals with employer-sponsored insurance are 1.4 times as likely to have had a dental visit in the previous 12 months and those who purchase insurance directly are 1.15 times as likely to experience a dental visit. Income is a strong predictor of experiencing a dental visit. Consistent with the current dental access literature (Hinton & Paradise, 2016) I find that non-elderly adults on Medicaid are less likely to experience a dental visit compared with those covered by private insurance types.

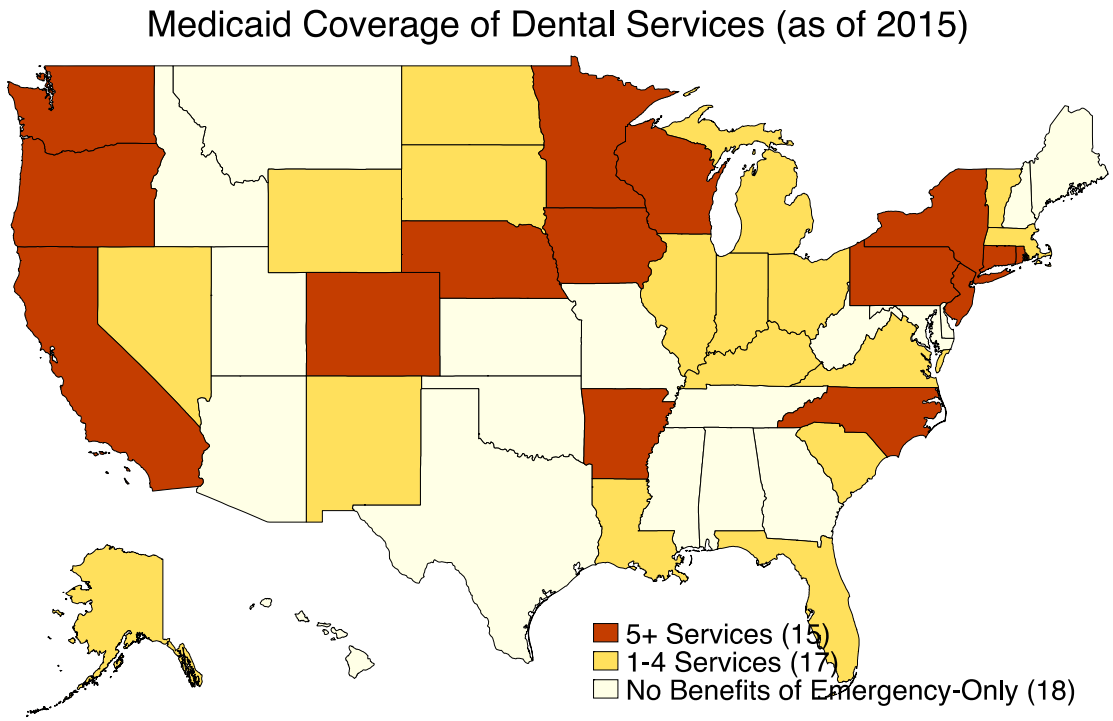
In Aim 2 I estimate the odds of experiencing a dental visit among the Medicaid-only cohort based on the number of service types offered to the non-elderly adult Medicaid population in the state. In both, the base model and "saturated model" controlling for other state characteristics I find a statistically significant relationship between the level of benefits offered to beneficiaries and the odds of experiencing a dental visit in the previous year. Although a binary relationship between Medicaid coverage and use of services has been established in the literature (Choi, 2011), no other studies have taken into account the scope of dental benefits and state-imposed service limits in relation to use of dental services within the Medicaid population. I add further context by controlling for dental health professional shortage areas, state median income, and Medicaid expansion status.

Understanding factors associated with the use of dental services is necessary to adequately address health needs of the Medicaid population. Further, considering the growing body of evidence that inadequate Medicaid coverage affects the use of dental

services within hospital emergency rooms (California HealthCare Foundation, 2011), (Cohen et al., 2002), (Singhal et al., 2015). (Laniado et al., 2017), (Wall & Nasseh, 2013) these findings fill a necessary gap in the current literature on the scope of services offered and the extent to which they impact health care spending within the entire health care system. Further research is necessary to look at how dental providers react to payment for services in Medicaid. Given the strong evidence on the impact of dentist density on use of dental services (Fingar et al., 2015), understanding how providers react may increase states' abilities to address the health care needs of their Medicaid population.

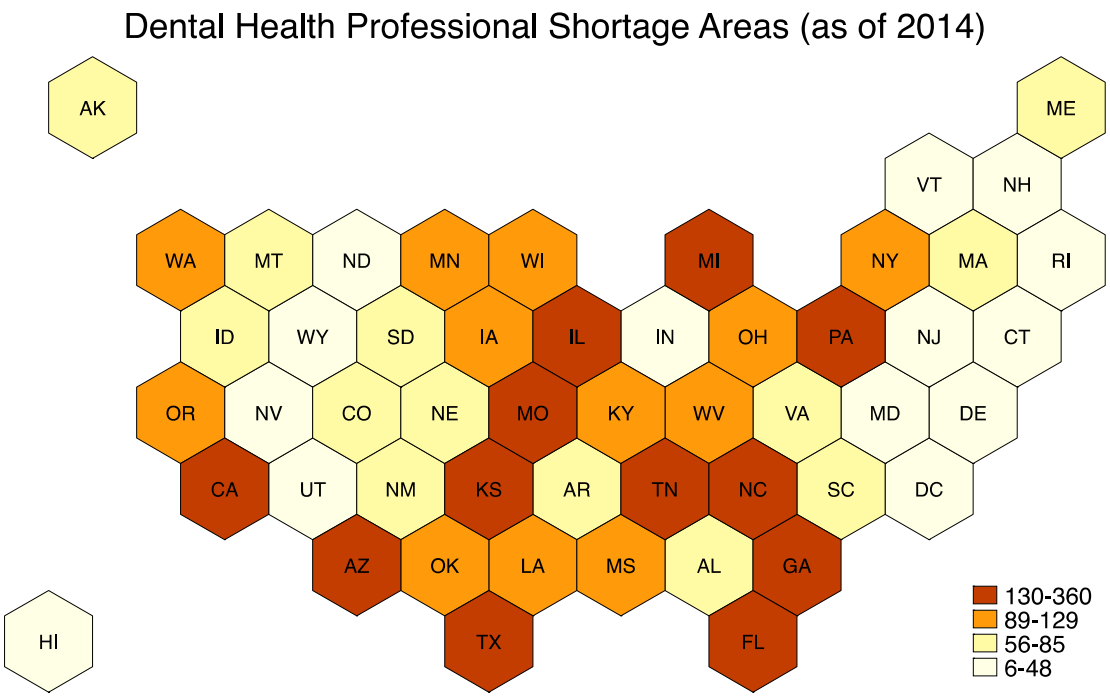
Appendices

1.0 Mapped supplemental state characteristics:



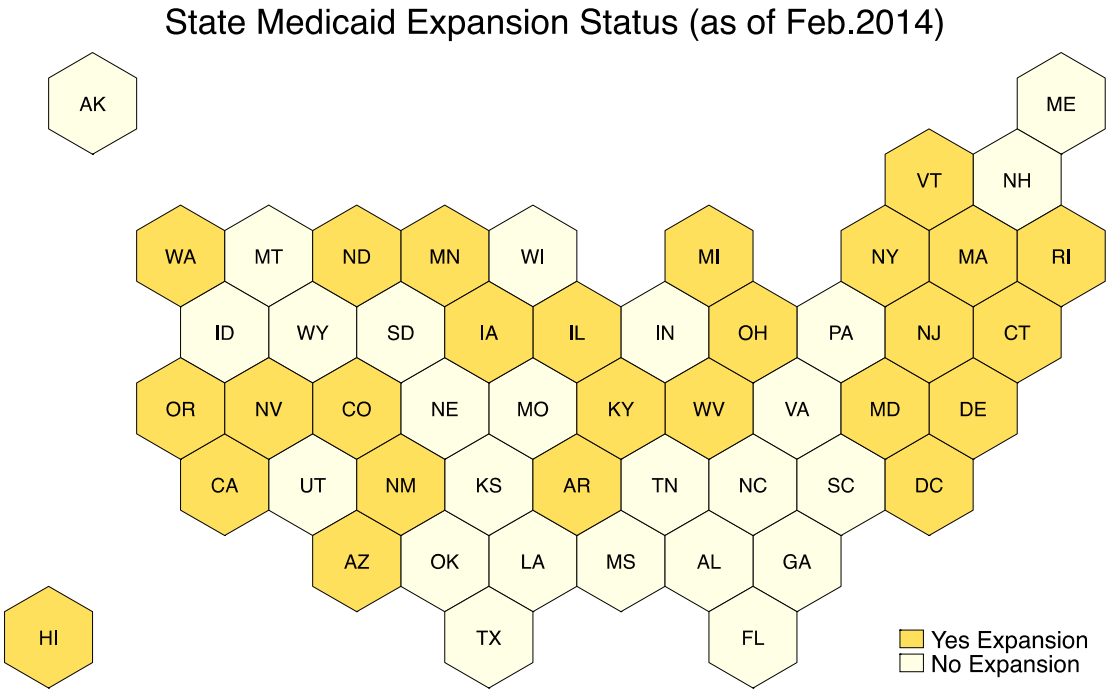
Source: MACPAC Report to Congress on Medicaid and CHIP, June 2015

Notes: 1. Stata 15 was used to generate this map.



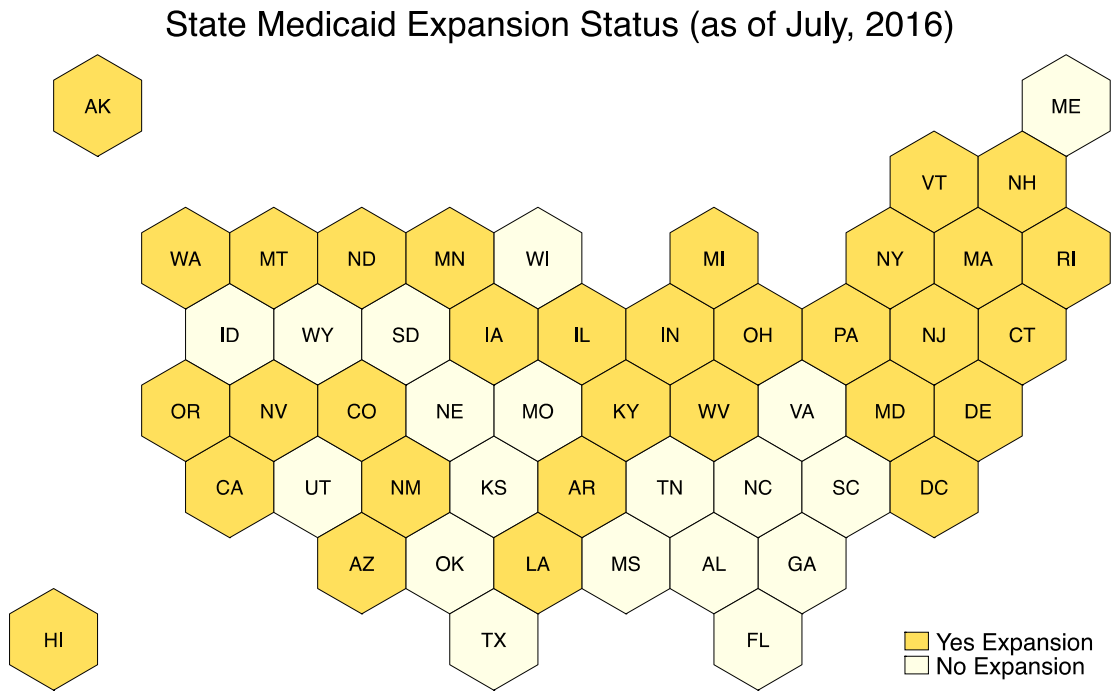
1.Source: HRSA, https://datawarehouse.hrsa.gov/tools/factsheets.aspx 2. HPSA counts are not to scale with state pop.

Notes: 1. Stata 15 was used to generate this map. 2. Federal regulations stipulate that, for dental geographic designations, the ratio must be at least 5,000 to 1. For dental population designations or geographic designations in areas with unusually high needs, the threshold is 4,000 to 1 (Health Resources and Services Administration (HRSA), 2017).



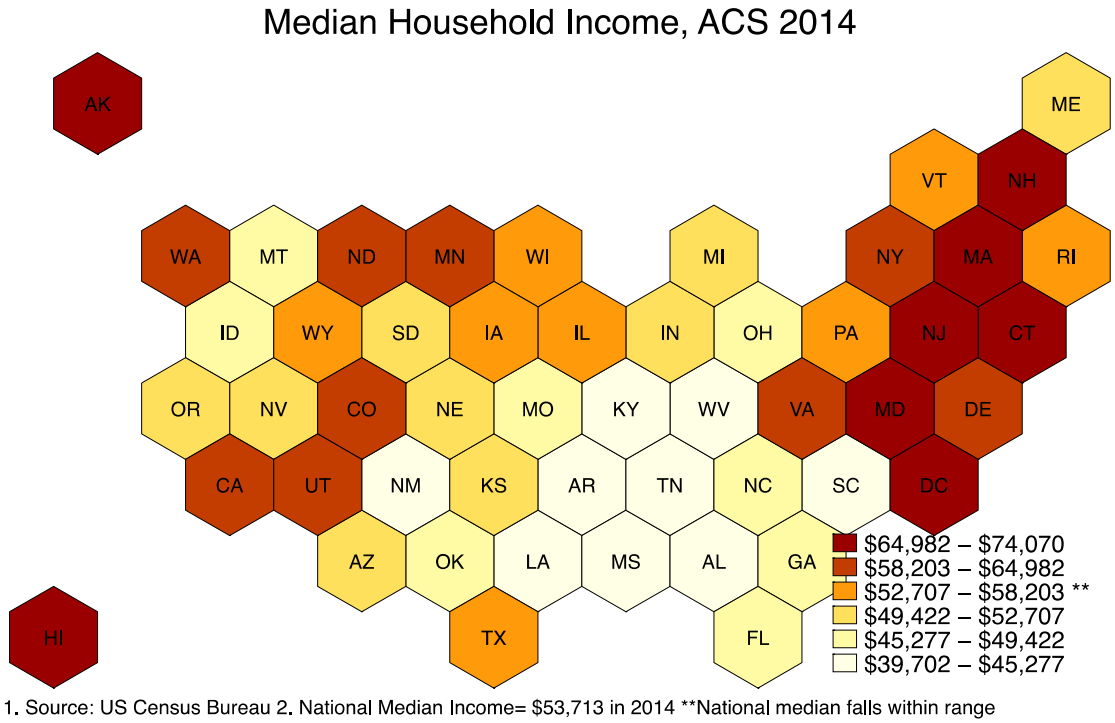
Source: MACPAC, 2014

Notes: 1. Stata 15 was used to generate this map.



Source: CMS, 2016

Notes: 1. Stata 15 was used to generate this map.



1. Source: US Census Bureau 2. National Median Income= $53,713 in 2014 **National median falls within range

Notes: 1. Stata 15 was used to generate this map.

1.1: Table 1. Sample characteristics of non-elderly adults by insurance type, 2014&2016 BRFSS:

	esi		self-buy		Medicaid		uninsured		**Total**		**Unweighted**	**Weighted**
	rate	se	rate	se	rate	se	rate	se	rate	se	Obs	Obs
Dental Visit Past Yr.												
No	24%	0.2	31%	0.6	48%	0.7	49%	4.09	28%	0.2	40,290	23,954,597
Yes	76%	0.2	69%	0.6	52%	0.7	51%	4.09	73%	0.2	121,283	63,036,247
Total	100%		100%		100%		100%		100%		161,573	86,990,844
Household Income												
Less than $10,000	1%	0.06	4%	0.3 2	24%	0.6 2	21%	4.06	4%	0.1	5,214	3,347,210
$10,000-$19,999	3%	0.1	10%	0.4 2	36%	0.7 1	29%	3.61	8%	0.1 3	10,324	6,564,074
$20,000-$34,999	12%	0.1 7	22%	0.5 4	28%	0.6 6	30%	3.6	15%	0.1 7	21,746	12,968,857
$35,000-$49,999	14%	0.1 8	16%	0.4 5	8%	0.4	8%	1.97	14%	0.1 5	21,834	11,762,595
$50,000-$74,999	20%	0.2	17%	0.4 8	3%	0.2 2	6%	1.92	18%	0.1 7	30,462	15,596,426
$75,000+	50%	0.2 5	31%	0.5 9	3%	0.2 5	6%	1.43	42%	0.2 1	71,993	36,751,682
Total	100%		100%		100%		100%		100%		161,573	86,990,844
Age												
18-24	10%	0.1 9	25%	0.6 6	15%	0.5 6	12%	2.6	12%	0.1 8	9,623	10,722,774
25-34	18%	0.2	16%	0.4 8	28%	0.7	22%	3.3	19%	0.1 8	21,831	16,698,696
35-44	23%	0.2 1	15%	0.4 6	22%	0.6 1	20%	3.66	22%	0.1 9	31,221	19,107,030
45-54	26%	0.2 1	19%	0.4 5	19%	0.5 3	22%	3.79	24%	0.1 8	43,686	21,261,552
55-64	23%	0.1 8	25%	0.4 7	16%	0.4 7	25%	2.95	22%	0.1 6	55,212	19,200,792
Total	100%		100%		100%		100%		100%		161,573	86,990,844
sex												
Male	50%	0.2 5	50%	0.6 5	33%	0.7	54%	4.07	48%	0.2 2	68,960	41,777,826
Female	50%	0.2 5	50%	0.6 5	67%	0.7	46%	4.07	52%	0.2 2	92,613	45,213,018
Total	100%		100%		100%		100%		100%		161,573	86,990,844
Race												
Non-Hisp. White	76%	0.2 3	75%	0.6 3	55%	0.7 3	34%	3.51	74%	0.2 1	131,540	64,044,570

		0.1		0.4		0.6			13	0.1		11,131,5
Non-Hisp. Black	12%	7	11%	6	24%	7	27%	3.9	%	6	13,895	44
Non-Hisp.		0.1								0.1		5,256,30
Multiple/Other	6%	3	7%	0.4	7%	0.4	14%	2.6	6%	2	7,519	3
		0.1		0.3		0.5				0.1		6,558,42
Hispanic	7%	4	7%	8	14%	3	25%	4.04	8%	3	8,619	7
	100		100		100		100		10			86,990,8
Total	%		%		%		%		0%		161,573	44
Marital Status												
Not Currently		0.2		0.6		0.6			42	0.2		36,114,4
Married	35%	5	52%	4	73%	5	63%	4	%	2	59,502	35
		0.2		0.6		0.6			59	0.2		50,876,4
Married	65%	5	48%	4	27%	5	37%	4	%	2	102,071	09
	100		100		100		100		10			86,990,8
Total	%		%		%		%		0%		161,573	44
Education												
High School or		0.2		0.6					34	0.2		29,677,8
Less	30%	5	36%	5	61%	0.7	63%	3.74	%	2	43,672	01
		0.2		0.6		0.6			33	0.2		28,282,4
Some College	32%	4	36%	3	30%	6	25%	3.4	%	1	44,937	54
Bachelor's or		0.2		0.5		0.3			33	0.1		29,030,5
More	38%	2	29%	2	9%	4	12%	1.94	%	9	72,964	89
	100		100		100		100		10			86,990,8
Total	%		%		%		%		0%		161,573	44
Health Status												
Very		0.2		0.6		0.6			60	0.2		51,725,3
Good/Excellent	63%	4	62%	3	34%	9	39%	4.05	%	2	98,436	82
		0.2		0.5					29			25,279,9
Good	29%	3	28%	8	33%	0.7	34%	3.71	%	0.2	45,548	06
		0.1		0.3		0.6			12	0.1		9,985,55
Fair/Poor	9%	5	11%	9	33%	9	26%	3.87	%	5	17,589	6
	100		100		100		100		10			86,990,8
Total	%		%		%		%		0%		161,573	44
Days Mental Health Not Good												
		0.2		0.6		0.7			64	0.2		55,529,4
0	66%	4	64%	3	47%	3	63%	3.94	%	2	107,007	16
		0.2		0.5		0.6			25			22,036,0
1-10	25%	2	26%	7	26%	6	22%	3.15	%	0.2	39,166	69
		0.1		0.3		0.4				0.1		4,489,45
11-20	4%	1	5%	1	11%	7	8%	2.86	5%	1	7,171	6
		0.1		0.2		0.5				0.1		4,935,90
21-30	4%	1	5%	9	17%	4	7%	1.65	6%	1	8,229	4
	100		100		100		100		10			86,990,8
Total	%		%		%		%		0%		161,573	44
INTERVIEW YEAR												
		0.1		0.5		0.5			83	0.1		72,205,5
2014	83%	7	81%	3	82%	2	90%	2.57	%	5	137,027	24
		0.0		0.1		0.1				0.0		
2015	1%	6	1%	4	1%	1	0%	0.05	1%	5	1,170	745,831
		0.1		0.5		0.5			16	0.1		14,039,4
2016	16%	6	18%	2	17%	1	10%	2.57	%	4	23,376	89
	100		100		100		100		10			86,990,8
Total	%		%		%		%		0%		161,573	44

Notes: 1. Rates are weighted. 2. Not all states asked the insurance-type question in 2014 and 2016. This is not a nationally representative sample of the US population. 3. Strata with single sampling unit centered at overall mean. 4. Race category non-Hisp. Multiple/Other includes Asian, AIAN, Native Hawaiian/Pacific Islander, and other.
Source: BRFSS 2014&2016

1.2 Table 3. Sample characteristics of non-elderly Medicaid adults by level of Medicaid benefits offered, clustered on state-level, 2014&2016 BRFSS:

	None or Emergency-Only		1-4 Services		5+ Services		Total		Unweighted	Weighted
	rate	se	rate	se	rate	se	rate	se	Obs	Obs
Dental Visit Past Yr.										
No	61%	2.5	49%	2.4	43%	1.84	48%	1.91	7,186	4,550,351
Yes	39%	2.5	51%	2.4	57%	1.84	52%	1.91	7,856	4,870,550
Total	100%		100%		100%		100%		15,042	9,420,902
Household Income										
Less than $10,000	27%	1.98	25%	1.39	21%	1.16	24%	0.96	3,750	2,219,972
$10,000-$19,999	36%	2.26	34%	1.29	37%	1.39	36%	0.96	5,347	3,350,085
$20,000-$34,999	26%	1.83	28%	1.55	28%	1.23	28%	0.86	4,040	2,623,965
$35,000-$49,999	6%	0.69	7%	0.8	8%	0.61	8%	0.45	1,007	709,521
$50,000-$74,999	2%	0.27	3%	0.35	3%	0.5	3%	0.27	478	255,283
$75,000+	3%	0.69	3%	0.39	3%	0.31	3%	0.24	420	262,076
Total	100%		100%		100%		100%		15,042	9,420,902
Age										
18-24	15%	1.4	16%	1.15	14%	1.11	15%	0.73	1,262	1,418,998
25-34	29%	0.98	28%	1.05	29%	1.77	28%	0.91	3,095	2,679,122
35-44	22%	1.57	23%	1.16	21%	1.28	22%	0.84	3,046	2,059,181
45-54	19%	0.8	18%	0.69	20%	0.37	19%	0.36	3,520	1,793,018
55-64	15%	1.07	15%	1	16%	0.83	16%	0.63	4,119	1,470,583
Total	100%		100%		100%		100%		15,042	9,420,902
Sex										

Male	29%	1.98	31%	1.95	35%	1.57	33%	1.28	4,499	3,077,677
Female	71%	1.98	69%	1.95	65%	1.57	67%	1.28	10,543	6,343,225
Total	100%		100%		100%		100%		15,042	9,420,902
Race										
Non-Hisp. White	53%	5.95	55%	5.65	56%	4.69	55%	3.18	9,371	5,163,138
Non-Hisp. Black	31%	8.03	26%	4.84	20%	2.7	24%	2.69	2,699	2,272,209
Non-Hisp. Multiple/Other	5%	0.81	5%	1.22	9%	1.11	7%	0.83	1,208	648,993
Hispanic	11%	4.95	14%	5	16%	3.79	14%	2.76	1,764	1,336,562
Total	100%		100%		100%		100%		15,042	9,420,902
Marital Status										
Not Currently Married	73%	2.12	75%	1.6	73%	1.29	73%	0.95	10,972	6,913,224
Married	28%	2.12	25%	1.6	28%	1.29	27%	0.95	4,070	2,507,678
Total	100%		100%		100%		100%		15,042	9,420,902
Education										
High School or Less	66%	3.27	61%	1.18	58%	1.81	61%	1.14	7,939	5,698,284
Some College	27%	2.6	30%	1.03	32%	1.48	30%	0.87	4,658	2,868,663
Bachelor's or More	7%	1.06	9%	0.83	10%	1.02	9%	0.64	2,445	853,955
Total	100%		100%		100%		100%		15,042	9,420,902
Health Status										
Very Good/Excellent	34%	2.01	33%	1.66	35%	1.52	34%	0.99	4,944	3,205,875
Good	28%	1.69	34%	1	34%	0.82	33%	0.77	4,857	3,116,789
Fair/Poor	38%	2.12	33%	1.68	31%	1.83	33%	1.17	5,241	3,098,237
Total	100%		100%		100%		100%		15,042	9,420,902
Medicaid Expansion										
No	59%	17.61	14%	7.73	22%	10.66	25%	7.1	3,591	2,333,054
Yes	41%	17.61	86%	7.73	78%	10.66	75%	7.1	11,451	7,087,847
Total	100%		100%		100%		100%		15,042	9,420,902
4 quantiles of Median Income										
1	69%	12.22	62%	15.79	6%	6.04	38%	10.35	6,176	3,613,581
2	11%	8.96	4%	3.31	25%	11.36	14%	5.54	2,259	1,357,184

3	9%	6.84	15%	13.45	55%	15.21	32%	11.19	3,217	3,001,225
4	12%	9.8	18%	11.4	14%	8.72	15%	6.17	3,390	1,448,912
Total	100%		100%		100%		100%		15,042	9,420,902
4 quantiles of #HPSAs										
1	21%	11.89	8%	4.66	11%	7.78	11%	4.45	3,627	1,070,806
2	13%	9.6	37%	13.85	13%	9.32	22%	7.67	4,722	2,096,891
3	15%	10.55	28%	13.27	54%	19.9	37%	11.38	4,667	3,500,469
4	52%	17.84	28%	16.2	22%	18.8	29%	11.01	2,026	2,752,736
Total	100%		100%		100%		100%		15,042	9,420,902
INTERVIEW YEAR										
2014	85%	8.71	81%	8.28	83%	10.86	82%	5.98	12,005	7,763,205
2015	1%	0.7	1%	0.4	0%	0.1	1%	0.21	60	43,814
2016	14%	8.94	19%	8.4	17%	10.92	17%	6.03	2,977	1,613,883
Total	100%		100%		100%		100%		15,042	9,420,902

Notes: 1. Rates are weighted. 2. Not all states asked the insurance-type question in 2014 and 2016. This is not a nationally representative sample of the US Medicaid population. 3. Strata with single sampling unit centered at overall mean. 4. Race category non-Hisp. Multiple/Other includes Asian, AIAN, Native Hawaiian/Pacific Islander, and other. Source: BRFSS 2014&2016

1.3 Sensitivity Analysis for State clustered model:

Table 7. Sensitivity Analysis, Dental Visits among Nonelderly Adults with any Private Insurance and Household Income below US Median (HPSAS, Median Income, Expansion), 2014&2016 BRFSS:

Dental Visit	Odds Ratio	Std. Err.	t	P>|t|
Dental Benefits				
None or Emergency-Only	Ref.			
1-4 Services	1.034657	.0562409	0.63	0.534
5+ Services	1.063859	.0420338	1.57	0.123
Income				
<$10,000	Ref.			
$10,000-$19,999	.8386818	.1036943	-1.42	0.161
$20,000-$34,999	.9450361	.0929964	-0.57	0.568

$35,000-$49,999	1.223687	.1518982	1.63	0.110
Age (years)				
18-24	Ref.			
25-34	.6283227	.0441666	-6.61	0.000
35-44	.6436755	.0425428	-6.67	0.000
45-54	.7194837	.0580589	-4.08	0.000
55-64	.8031239	.0541968	-3.25	0.002
Sex				
Female	1.49269	.0443246	13.49	0.000
Race				
Non-Hisp. White	Ref.			
Non-Hisp. Black	.96439	.0470843	-0.74	0.461
Non-Hisp. Multiple/Other	.8873345	.0277901	-3.82	0.000
Hispanic	1.0856	.0712539	1.25	0.217
Marital Status				
Married	1.073644	.0522018	1.46	0.150
Education				
H.S. or Less	Ref.			
Some College	1.15019	.0623929	2.58	0.013
Bachelor's or More	1.469706	.0707162	8.00	0.000
Health Status				
Very Good/Excellent	Ref.			
Good	.7385756	.0324838	-6.89	0.000
Fair/Poor	.5897008	.0254417	-12.24	0.000
Medicaid Expansion				
Yes	.9718876	.0383733	-0.72	0.474
State Median Income	**1.000012**	**2.08e-06**	**5.85**	**0.000**
#HPSAs	**1.000311**	**.0005912**	**0.53**	**0.601**
Interview year				
2014	Ref.			
2015	.861283	.0973354	-1.32	0.192
2016	.9574341	.0460811	-0.90	0.370
_cons	.968804	.1967332	-0.16	0.877
				Notes:

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